

1 METHODS AND APPARATUS FOR INTERNATIONAL
2 CELLULAR TELEPHONE CALLS

3
4 BACKGROUND OF THE INVENTION

5
6 1. Field of the Invention

7 The invention relates to telecommunications. More
8 particularly, the invention relates to international cellular
9 telecommunications.

10
11 2. State of the Art

12 To many people, cellular telephones have become a necessity.
13 Business people who travel frequently rely on cellular telephones
14 to keep in touch with colleagues and clients. The cellular
15 telephone networks throughout the civilized world work quite well.
16 However, if a traveller brings a cellular telephone from one
17 country to another, problems may arise. In many cases, a cellular
18 telephone which was activated in one country will not operate at
19 all in another country. In other cases, the telephone will
20 operate but not economically as international "roaming" charges
21 are often quite high.

22
23 One of the solutions to the problems of international
24 cellular telecommunications is to rent a local cell phone when

1 visiting a foreign country. These phones are often offered for
2 rent at car rental agencies. However, the per minute cost of
3 operating these rented cell phones is up to ten times the per
4 minute charge usually paid for regular cell phone service. In
5 addition, these rental phones have a phone number local to the
6 country in which they are rented. Thus, a call to or from a
7 rental phone to the home country of the renter will often involve
8 an expensive international calling rate. Further, the renter will
9 not know what the phone number is until the phone is rented.
10 Therefore, the new cell phone number must be circulated to all of
11 the renter's colleagues and clients if the renter is to be
12 reachable.

SUMMARY OF THE INVENTION

16 It is therefore an object of the invention to provide methods
17 and apparatus for international cellular telephone calls.

19 It is also an object of the invention to provide methods and
20 apparatus for international cellular telephone calls which allow a
21 caller to travel to another country and obtain economical cellular
22 telephone service.

1 It is another object of the invention to provide methods and
2 apparatus for international cellular telephone calls which allow
3 the cell phone user to keep the same phone number when traveling
4 in other countries.

5
6 It is still another object of the invention to provide
7 methods and apparatus for international cellular telephone calls
8 which operate transparently to the callers.

9
10 In accord with these objects which will be discussed in
11 detail below, the methods of the present invention include
12 obtaining cellular telephones numbers in bulk associated with a
13 cellular telephone service in a destination country, providing
14 cellular phones which have been programmed with the telephone
15 numbers to travelers from an origin to the destination country,
16 providing dedicated switching equipment in the destination
17 country, and programming the cell phones and the switching
18 equipment to direct calls to the origin country from the
19 destination country through the dedicated switching equipment.
20 Optionally, dedicated switching equipment is provided in the
21 origin country and all calls from the origin country to the
22 destination country are routed through the dedicated switching
23 equipment in the origin country. The apparatus of the invention
24 includes the cell phones, the switching equipment, and the

1 communication link(s) between the origin and destination
2 countries. According to the presently preferred embodiment, the
3 dedicated switching equipment and the cell phones are owned by the
4 same company or related companies. The communications link(s)
5 between the origin and destination countries is (are) preferably
6 leased from another company.

7
8 In order to allow the user to maintain the same phone number
9 while traveling in a foreign country (i.e. the destination
10 country), one method of the invention include forwarding calls
11 destined for the user's local phone number to the dedicated
12 switching equipment in the origin country and programming the
13 dedicated switching equipment to forward these calls to the number
14 of the cell phone the user rented. Alternatively, methods of the
15 invention allow for forwarding calls to the user's local phone
16 number directly to the rented cell phone or assigning a new local
17 number for forwarding calls to the rented cell phone. In cases
18 where the local phone number is a cell phone number, the local
19 cell phone company provides the means for forwarding or
20 redirecting to the rented phone or to the dedicated switching
21 equipment. In cases where the local phone number is a wireline
22 phone number, the local PSTN provides the means for forwarding or
23 redirecting to the rented phone or to the dedicated switching

1 equipment. Different methods of forwarding/redirecting are disclosed.

2
3 According to presently preferred aspects of the invention,
4 local calls in the destination country are processed by switches
5 of the local cell phone company but international calls are
6 processed by the dedicated switching equipment in the destination
7 country. The cell phones and/or the accounts associated with the
8 cell phones are preferably programmed to direct all international
9 calls, i.e. all phone numbers starting with an international
10 dialing code, e.g. zero, to the dedicated switching equipment in
11 the U.S.. Alternatively, the phones are programmed to speed dial
12 to the dedicated switching equipment for making international
13 calls. Billing international calls to a rented phone is
14 preferably effected using Caller ID. According to a presently
15 preferred embodiment, the dedicated switching equipment is
16 signalled when a phone is rented that the phone is "active" and is
17 signalled when a phone is returned that the phone is "inactive".

18
19 Additional objects and advantages of the invention will
20 become apparent to those skilled in the art upon reference to the
21 detailed description taken in conjunction with the provided
22 figures.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a simplified flow chart illustrating the methods of the invention; and

Figure 2 is a schematic illustration of the distribution of the apparatus of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention is described herein with the destination country being the United States and the origin country being some other country. It will be appreciated, however, that the methods of the invention could be applied to any two countries. In addition, for purposes herein, the terms "international" and "outside the U.S." are intended to mean places where a country code must be dialed to effect calls to/from the U.S.

Turning now to Figure 1, a method according to the present invention includes purchasing U.S. cellular telephone numbers in bulk from a U.S. cell phone company as illustrated at 10 in Figure 1. According to the invention, the actual phones need not be purchased or programmed in the U.S. All that is required is that the phones be associated with a valid U.S. cell phone telephone

1 number. Preferably, an arrangement is made with the U.S. cell
2 phone company that, when the phones are inactive, the monthly
3 service charge will be minimal and the regular monthly service
4 charge will be applied only if the phone is used. If actual
5 phones are purchased in bulk in the U.S., they are optionally
6 brought out of the U.S. to an origin country as illustrated in
7 phantom at 12 in Figure 1. Whether the phones are taken to the
8 origin country or remain in the U.S., they are rented to people
9 who are traveling from the origin country to the U.S. as indicated
10 by 14 in Figure 1. Preferably, though not necessarily, before
11 leaving the origin country, a phone number local to the origin
12 country is associated with the rented phone as indicated at 16 in
13 Figure 1. This local number may be the local cell phone number,
14 home phone number, office phone number, etc. (or all of those
15 numbers) of the person renting the phone or a "new" local number
16 assigned at the time of rental. After the local number is
17 associated with the rented cell phone, all calls to this local
18 number are forwarded to the rented phone's U.S. phone number as
19 indicated at 18 in Figure 1. According to the presently preferred
20 embodiment, one or more designated switches in the U.S. are
21 associated with the rented phones as indicated at 20 in Figure 1.
22 All international calls from the rented phone are preferably
23 routed through this designated switch as shown by 22 in Figure 1.

1 According to one embodiment of the invention, the step of
2 associating a local phone number with the rented phone (step 16 in
3 Figure 1) is effected by the process of forwarding all calls
4 received by the local number(s) directly to the phone number of
5 the rented phone using the local telephone company equipment.
6 According to a first alternate embodiment, this step is effected
7 by the process of forwarding all calls received by the local
8 number(s) to dedicated switching equipment in the origin country
9 which forwards the call to the rented cell phone. For the first
10 alternate embodiment to work, the identity of the number from
11 which the calls are forwarded must be provided to the dedicated
12 switching equipment. According to a second alternate embodiment,
13 a dedicated "new" local phone number is assigned. This new number
14 is a DID (direct inward dial) number to the dedicated switching
15 equipment which forwards the call to the rented cell phone. The
16 renter has the local phone company forward all of his calls to
17 this new DID number. According to a third alternate embodiment,
18 The renter does not have calls forwarded to the DID number but
19 instructs colleagues and clients to call him via the DID number.
20 As another alternative, the renter can instruct colleagues and
21 clients to call the U.S. phone number of the rented phone. The
22 preferred embodiment will depend on the cost of calling the U.S.
23 from the origin country and the availability of forwarding service
24 in the origin country. If the service is available and the cost

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1 is acceptable, the calls will be forwarded to or directly dialed
2 to the U.S. cell phone number. If the cost is not acceptable, the
3 calls will be routed through dedicated switching equipment in the
4 origin country.

5
6 In all of these embodiments, the step of associating the
7 local phone number with the rented phone ("activating") is
8 performed when or before the renter picks up the phone. When the
9 rented phone is returned, the local phone number is disassociated
10 from the phone ("deactivated").

11
12 Those skilled in the art will appreciate that the methods of
13 the invention can be performed by providing the rental phones in
14 the U.S. rather than in another country. Accordingly, the rental
15 agreement and the assignment of a U.S. phone number may take place
16 outside the U.S., with the delivery of the cell phone occurring in
17 the U.S., e.g., at an airport of arrival. Moreover, the rental
18 agreement, the assignment of a U.S. phone number, and the delivery
19 of the cell phone may all take place within the U.S. In this
20 situation, a mechanism must be provided to associate the phone
21 number local to the origin country with the U.S. cell phone
22 number. By way of example, the cell phone user may call a
23 customer service center, or make a call to the origin country to
24 program the phone number local to the origin country to forward

1 calls to the U.S. cell phone, or call the dedicated switch in the
2 U.S. or origin country and, through interactive response, request
3 that the switch call the telephone company in the origin country
4 and setup the call forwarding.

5
6 According to presently preferred aspects of the invention,
7 local calls in the U.S. are processed by switches of the local
8 cell phone companies but international calls are processed by the
9 dedicated switching equipment in the U.S. The cell phones are
10 preferably programmed to speed dial to the dedicated switching
11 equipment for making international calls. Billing international
12 calls to a rented phone is preferably effected using Caller ID.

13 According to a presently preferred embodiment, the dedicated
14 switching equipment is signalled when a phone is rented that the
15 phone is "active" and is signalled when a phone is returned that
16 the phone is "inactive".

17
18 Depending on the international toll rates of the origin
19 country, calls from the origin country to the rented U.S. cell
20 phone may be carried by the public network. Alternatively, calls
21 from the origin country to the rented U.S. cell phone are carried
22 by a private network between the dedicated switching equipment in
23 the origin country and in the U.S.

24

1 Referring now to Figure 2, the apparatus of the invention
2 includes the cell phones 100 which were purchased in bulk from a
3 U.S. cell phone company, taken outside the U.S., rented outside
4 the U.S. and carried back to the U.S. as shown by numeral 100a.
5 The apparatus also includes dedicated switching equipment 102 in
6 the U.S., communication links 104 to the origin country, and
7 optionally, dedicated switching equipment 106 in the origin
8 country. As shown in Figure 2, the switching equipment 102 is
9 coupled to the U.S. cell phone network. The optional switching
10 equipment 106 is coupled to the PSTN (not shown) of the origin
11 country. Both switching equipment 102 and 106 are coupled to the
12 communication links 104.

13
14 According to the presently preferred embodiment, the
15 dedicated switching equipment and the cell phones are owned by the
16 same company, related companies, or associated companies. The
17 communications link(s) between the U.S. and the origin country is
18 (are) preferably leased from another company.

19
20 It will be appreciated that the dedicated switch may be part
21 of the cell phone network and leased by the owner of the rental
22 cell phones. In addition, the cell network may be configured such
23 that calls between rental phones are free. Moreover, calls to the
24 dedicated switch can be free of airtime charges. It will also be

1 appreciated that the dedicated switch can be configured to provide
2 services such as voice mail, call screening/blocking, conference
3 calling etc. According to the invention, voice mail which is not
4 retrieved before the rental phone is returned may be forwarded to
5 the voice mail system of the renter in the country of origin.

6
7 There have been described and illustrated herein several
8 embodiments of methods and apparatus for international cellular
9 telephone calls. While particular embodiments of the invention
10 have been described, it is not intended that the invention be
11 limited thereto, as it is intended that the invention be as broad
12 in scope as the art will allow and that the specification be read
13 likewise. It will therefore be appreciated by those skilled in
14 the art that yet other modifications could be made to the provided
15 invention without deviating from its spirit and scope as so
16 claimed.